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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/663,824 | 09/16/2003 | Thomas L. Davis | 073671.0191 | 2669 |

7590 03/31/2006

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| EXAMINER | |
|---|---|
| LE, LANA N | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2618 | |

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/663,824 | DAVIS, THOMAS L. | |
| | Examiner | Art Unit | |
| | Lana N. Le | 2685 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7,10,16-18 and 21* is/are rejected.

7)☒ Claim(s) *2-6,8-9,11-15,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 4 and 13 are objected to because of the following informalities: in claim 4 line 29, after "generate", "a" should be "an"; in claim 13, after "generate", "a" should be "an". In claim 19, line 6, before "combining", add "the". In claim 20, line 6, before "combining" add "the". In claim 20, line 22, after "generate", "a" should be "an". Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7, 10, 16-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruitenburg (JP 07-321603) in view of Nash (EP 0,883,237).

Regarding claim 1, Ruitenburg discloses a circuit (fig. 2) for frequency translating a radio frequency signal, comprising:

a plurality of mixer stages (14, 15, 16), each mixer stage associated with a particular range of frequencies of a radio frequency signal (paragraph 10);

a switching circuit (25, 26, 27) operable to communicate the radio frequency signal to a selected one of the plurality of mixer stages in response to a control signal

(29) (para. 10). Ruitenburg does not disclose the selected mixer stage comprising a phase generation circuit operable to generate a plurality of phase signals; at least one mixer operable to combine the radio frequency signal with one of the plurality of phase signals to generate at least a portion of an intermediate frequency signal, wherein the radio frequency signal is weighted according to a weighting factor.
However, Nash discloses the selected mixer stage comprising a phase generation circuit (314) operable to generate a plurality of phase signals; at least one mixer (106, 308) operable to combine the radio frequency signal (received via 102, 104) with one of the plurality of phase signals (from 314) to generate at least a portion of an intermediate frequency signal, wherein the radio frequency signal is weighted according to a weighting factor of one (page 3, lines 33-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a phase generation circuit to phase shift for quadrature downconversion to bring them into mutual phase quadrature as suggested by Nash (page 2, lines 24-30).

Regarding claim 7, Ruitenburg and Nash disclose the circuit of Claim 1, wherein Ruitenburg discloses the control signal identifies at least one of a signal of interest or a particular range of frequencies associated with a signal of interest (switch controlled by data line 29 to selectively switch to particular band associated with signal of interest; para. 10).

Regarding claim 10, Ruitenburg discloses a circuit for frequency translating a radio frequency signal, comprising:

a plurality of stages (14, 15, 16), each stage associated with a particular range of frequencies of a radio frequency signal (paragraph 10);

a switching circuit (25, 26, 27) operable to communicate the radio frequency signal to a selected one of the plurality of stages in response to a control signal (29) (para. 10).

Ruitenburg does not disclose the selected stage comprising means for generating a plurality of phase signals; and means for combining the radio frequency signal with one of the plurality of phase signals to generate at least a portion of an intermediate frequency signal, wherein the radio frequency signal is weighted according to a weighting factor.

Nash discloses means (314) for generating a plurality of phase signals; means (106, 308) for combining the radio frequency signal (received via 102, 104) with one of the plurality of phase signals (from 314) to generate at least a portion of an intermediate frequency signal, wherein the radio frequency signal is weighted according to a weighting factor of one (page 3, lines 33-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have means for phase shifting in quadrature downconversion to bring them into mutual phase quadrature as suggested by Nash (page 2, lines 24-30).

Regarding claim 16, Ruitenburg and Nash disclose the circuit of claim 10, wherein Ruitenburg discloses the control signal identifies at least one of a signal of interest or a particular range of frequencies associated with a signal of interest (switch

controlled by data line 29 to selectively switch to particular band associated with signal of interest; para. 10).

Regarding claim 17, Ruitenburg discloses a method for frequency translating a radio frequency signal, comprising:

communicating a radio frequency signal to a selected one of a plurality of mixer stages (14, 15, 16) in response to a control signal (29) (para. 10).
However, Ruitenburg does not disclose generating a plurality of phase signals; combining the radio frequency signal with at least one of the plurality of phase signals at the selected mixer stage to generate at least a portion of an intermediate frequency signal. Nash discloses generating a plurality of phase signals (via 314); combining (via 106, 308) the radio frequency signal (received via 102, 104) with at least one of the plurality of phase signals at the selected mixer stage to generate at least a portion of an intermediate frequency signal (page 3, lines 33-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to phase shift for quadrature downconversion to bring them into mutual phase quadrature as suggested by Nash (page 2, lines 24-30).

Regarding claim 18, Ruitenburg and Nash disclose the method of claim 17, wherein Nash discloses the method further comprising weighting the radio frequency signal according to at least one weighting factor of 1 (page 3, lines 33-49).

Regarding claim 21, Ruitenburg and Nash disclose the method of claim 17, wherein Ruitenburg discloses the control signal identifies at least one of a signal of interest or a particular range of frequencies associated with a signal of interest (switch

controlled by data line 29 to selectively switch to particular band associated with signal of interest; para. 10).

***Allowable Subject Matter***

4. Claims 2-6, 8-9, 11-15, 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, Ruitenburg discloses the circuit of claim 1, wherein Ruitenburg, Nash and the cited prior art do not disclose the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz; the radio frequency signal comprises a signal of interest approximately ranging from 212 MHz to 424 MHz;

the selected mixer stage comprises:

a first mixer operable to combine the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

a second mixer operable to combine the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

a third mixer operable to combine the radio frequency signal weighted according to a third weighting factor with a third phase signal to generate a third

output;

a fourth mixer operable to combine the radio frequency signal weighted according to a fourth weighting factor with a fourth phase signal to generate a fourth output; and

a summing circuit operable to combine the first, second, third, and fourth outputs to generate at least a portion of the intermediate frequency signal.

Regarding claim 4, Ruitenburg discloses the circuit of claim 1, wherein Ruitenburg, Nash and the cited prior art do not disclose the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz;

the radio frequency signal comprises a signal of interest ranging from 57 MHz to 212 MHz;

the selected mixer stage comprises:

a first mixer operable to combine the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

a second mixer operable to combine the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

a third mixer operable to combine the radio frequency signal weighted according to a third weighting factor with a third phase signal to generate a third output;

a fourth mixer operable to combine the radio frequency signal weighted

according to a fourth weighting factor with a fourth phase signal to generate a fourth output;

a fifth mixer operable to combine the radio frequency signal weighted according to a fifth weighting factor with a fifth phase signal to generate a fifth output;

a sixth mixer operable to combine the radio frequency signal weighted according to a sixth weighting factor with a sixth phase signal to generate a sixth output;

a seventh mixer operable to combine the radio frequency signal weighted according to a seventh weighting factor with a seventh phase signal to generate a seventh output;

an eighth mixer operable to combine the radio frequency signal weighted according to an eighth weighting factor with an eighth phase signal to generate a eighth output; and

a summing circuit operable to combine the first, second, third, fourth, fifth, sixth, seventh, and eighth outputs to generate at least a portion of the intermediate frequency signal.

Regarding claim 11, Ruitenburg and Nash disclose the circuit of Claim 10, wherein Ruitenburg, Nash and the cited prior art fail to disclose the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz; the radio frequency signal comprises a signal of interest approximately ranging from 212 MHz to 424 MHz;

the means for combining comprises:

first means for combining the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

second means for combining the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

third means for combining the radio frequency signal weighted according to a third weighting factor with a third phase signal to generate a third output;

fourth means for combining the radio frequency signal weighted according to a fourth weighting factor with a fourth phase signal to generate a fourth output; and

means for summing the first, second, third, and fourth outputs to generate at least a portion of the intermediate frequency signal.

Regarding claim 13, Ruitenburg and Nash disclose the circuit of claim 10, wherein Ruitenburg, Nash and the cited prior art fail to disclose:

the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz;

the radio frequency signal comprises a signal of interest ranging from 57 MHz to 212 MHz;

the means for combining comprises:

a first means for combining the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

a second means for combining the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

a third means for combining the radio frequency signal weighted according to a third weighting factor with a third phase signal to generate a third output;

a fourth means for combining the radio frequency signal weighted according to a fourth weighting factor with a fourth phase signal to generate a fourth output;

a fifth means for combining the radio frequency signal weighted according to a fifth weighting factor with a fifth phase signal to generate a fifth output;

a sixth means for combining the radio frequency signal weighted according to a sixth weighting factor with a sixth phase signal to generate a sixth output;

a seventh means for combining the radio frequency signal weighted according to a seventh weighting factor with a seventh phase signal to generate a seventh output;

an eighth means for combining the radio frequency signal weighted according to an eighth weighting factor with an eighth phase signal to generate a eighth output; and

means for summing the first, second, third, fourth, fifth, sixth, seventh, and eighth outputs to generate at least a portion of the intermediate frequency signal.

Regarding claim 19, Ruitenburg and Nash disclose the method of claim 17, wherein Ruitenburg, Nash and the cited prior art fail to disclose:

the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz;

the radio frequency signal comprises a signal of interest approximately ranging from 212 MHz to 424 MHz;

the combining further comprises:

combining the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

combining the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

combining the radio frequency signal weighted according to á third weighting factor with a third phase signal to generate a third output;

combining the radio frequency signal weighted according to a fourth weighting factor with a fourth phase signal to generate a fourth output; and

summing the first, second, third, and fourth outputs to generate at least a portion of the intermediate frequency signal.

Regarding claim 20, Ruitenburg and Nash disclose the method of claim 17, wherein Ruitenburg, Nash and the cited prior art fail to disclose:

the radio frequency signal comprises a bandwidth approximately ranging from 48 MHz to 852 MHz;

the radio frequency signal comprises a signal of interest ranging from 57 MHz to 212 MHz;

the combining further comprises:

combining the radio frequency signal weighted according to a first weighting factor with a first phase signal to generate a first output;

combining the radio frequency signal weighted according to a second weighting factor with a second phase signal to generate a second output;

combining the radio frequency signal weighted according to a third weighting factor with a third phase signal to generate a third output;

combining the radio frequency signal weighted according to a fourth weighting factor with a fourth phase signal to generate a fourth output;

combining the radio frequency signal weighted according to a fifth weighting factor with a fifth phase signal to generate a fifth output;

combining the radio frequency signal weighted according to a sixth weighting factor with a sixth phase signal to generate a sixth output;

combining the radio frequency signal weighted according to a seventh weighting factor with a seventh phase signal to generate a seventh output;

combining the radio frequency signal weighted according to an eighth weighting factor with an eighth phase signal to generate a eighth output; and

summing the first, second, third, fourth, fifth, sixth, seventh, and eighth outputs to generate at least a portion of the intermediate frequency signal.

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le

Lana N. Le
03-27-06

LANA LE
PRIMARY EXAMINER